Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (original) A method for mapping a user function for a programmable integrated circuit to a plurality of lookup tables, the method comprising:

decomposing the user function into a first set of decomposed functions, the user function receiving input variables;

determining whether the first set of decomposed functions can be implemented by one of a set of lookup table configurations for the programmable integrated circuit; and

if none of the set of lookup table configurations can implement the first set of decomposed functions, rotating at least two of the input variables of the user function.

2. (original) The method according to claim 1 further comprising:

decomposing the user function into a second set of decomposed functions; and

determining whether the second set of decomposed functions can be implemented by one of the set of lookup table configurations for the programmable integrated circuit.

3. (original) The method according to claim 1 further comprising:

if the user function is not successfully decomposed into a set of decomposed functions, rotating at least two of the input variables of the user function; and

attempting to decompose the user function into a second set of decomposed functions.

4. (original) The method according to claim 1 further comprising:

if one of the lookup table configurations can implement the first set of decomposed functions, placing lookup tables in the lookup table configuration into logic blocks on the programmable integrated circuit; and

configuring programmable routing resources to connect the logic blocks on the programmable integrated circuit.

5. (original) The method according to claim 4 wherein one of the lookup table configurations includes two 5-input lookup tables and one 6-input lookup table.

6. (original) The method according to claim 4 wherein at least two of the input variables are shared between two of the lookup tables.

7. (original) The method according to claim 4 wherein one of the lookup table configurations includes two 4-input lookup tables and one 6-input lookup table.

8. (original) The method according to claim 1 wherein decomposing the user function into the first set of decomposed functions further comprises decomposing the user function into first stage functions and a second stage function,

outputs of the first stage functions being inputs into the second stage function.

9. (original) The method according to claim 8 wherein rotating at least two of the input variables of the user function further comprises swapping at least one of the input variables of the first stage functions with at least one of the input variables of the second stage function.

10. (original) The method according to claim 9 further comprising:

attempting to decompose the user function into a second set of decomposed functions based on the rotated input variables.

11. (original) A computer program product stored on a computer readable medium for mapping a user function for a programmable integrated circuit to lookup tables, the computer program product comprising:

code for decomposing the user function into a first set of decomposed functions, wherein the user function receives input variables;

code for determining whether the first set of decomposed functions can be performed by a configuration of lookup tables on the programmable integrated circuit; and

code for rotating at least two of the input variables of the user function if none of the configurations of lookup tables can implement the first set of decomposed functions.

12. (original) The computer program product according to claim 11 further comprising:

code for rotating at least two of the input variables of the user function if the user function is not successfully decomposed into a set of decomposed functions; and

code for attempting to decompose the user function into a second set of decomposed functions.

13. (original) The computer program product according to claim 11 wherein the code for decomposing the user function into the first set of decomposed functions further comprises code for decomposing the user function into first stage functions and a second stage function, outputs of the first stage functions being inputs into the second stage function.

14. (original) The computer program product according to claim 13 wherein the code for decomposing further comprises:

code for decomposing the user function into a second set of decomposed functions based on the rotated input variables, the second set of decomposed functions including first stage functions and a second stage function,

wherein at least two input variables of the first and the second stages of the second set of decomposed functions have been rotated with respect to input variables of the first and the second stages of the first set of decomposed functions.

15. (original) The computer program product according to claim 11 wherein the code for decomposing the first function into the second functions further comprises code for decomposing the first function into the second functions using a non-disjoint decomposition technique.

16. (original) The computer program product according to claim 11 wherein the code for decomposing the first function into the second functions further comprises code for decomposing the first function into the second functions using a disjoint decomposition technique.

17. (original) The computer program product according to claim 11 further comprising:

code for placing lookup tables in one of the lookup table configurations into logic blocks on the programmable integrated circuit, if that lookup table configurations can implement the decomposed functions; and

code for configuring programmable routing resources to connect the logic blocks on the programmable integrated circuit.

18. (original) The computer program product according to claim 11 wherein one of the lookup table configurations includes two 5-input lookup tables and one 6-input lookup table.

19. (original) The computer program product according to claim 11 wherein one of the lookup table configurations includes two 4-input lookup tables and one 6-input lookup table.

20. (original) The computer program product according to claim 11 further comprising:

code for decomposing the user function into a second set of decomposed functions based on the rotated input variables, if none of the configurations of lookup tables can implement the first set of decomposed functions; and

code for determining whether the second set of decomposed functions can be implemented by one of the configurations of lookup tables for the programmable integrated circuit.